

Syllabus

Internship and contact information:

Internship: Dept. of Emergency Medicine - Understanding the epidemiology of preventable injuries
using the NEISS dataset

Semester: Summer 2022

Dates: 6/1/2022 to 7/22/2022

Location: 2120 L St NW, Suite 450, Washington, DC 20037

Supervisor:

Name: Dr. Jesus Trevino, MD, MBA

GW E-mail: jesus_trevino@gwu.edu

Internship prerequisites, if any:

Not applicable

Background and learning outcomes:

Injuries lead to significant morbidity and healthcare resource utilization and are the top cause of death among youth in the United States. Public health authorities and healthcare systems routinely develop and implement injury prevention programming and a key aspect of these activities involves injury surveillance. The primary objective of this summer internship is to produce an epidemiological analysis of trends in consumer product injuries (of interest to the student) using existing databases of consumer products injuries and hospitalizations.

Goals include:

1. Identification of consumer product injuries of interest that have not received adequate public health focus
2. Acquisition of statistical programming skills in R
3. Collection/data wrangling of data from 2010-2020
4. Application of survey analysis methods
5. Presentation of findings to the George Washington University Emergency Medicine Residency Program
6. Drafting of manuscript for publication in an injury prevention and/or emergency medicine journal
7. Creation of an infographic to communicate findings for the purposes of injury prevention programming

Required textbooks and/or other materials and recommended readings:

General information (required)

- Bakes, K. (2018). Injury Prevention and Control. In R. Walls (Ed.), *Rosen's Emergency Medicine: Concepts and Clinical Practice* (9th ed., pp. e22–e28). Elsevier. <https://www-clinicalkey-com.proxygw.wrlc.org/#!/content/book/3-s2.0-B9780323354790001987>
 - Chapter on injury prevention from a core textbook in emergency medicine
- Sleet, D. A., Baldwin, G., Marr, A., Spivak, H., Patterson, S., Morrison, C., Holmes, W., Peeples, A. B., & Degutis, L. C. (2012). History of Injury and Violence as public health problems and emergence of the National Center for Injury Prevention and Control at CDC. *Journal of Safety Research*, 43(4), 233–247. <https://doi.org/10.1016/J.JSR.2012.09.002>

Injury prevention programming (required)

- Kress, H. C., Noonan, R., Freire, K., Marr, A., & Olson, A. (2012). Top 20 violence and injury practice innovations since 1992. *Journal of Safety Research*, 43(4), 257–263. <https://doi.org/10.1016/J.JSR.2012.08.002>
- Venkatraman, V., Richard, C., Magee, K., & Johnson, K. (2021). *Countermeasures That Work: a highway safety countermeasures guide for State Highway Offices*, 10th edition. <https://www.ghsa.org/resources/countermeasures>

NEISS materials (required)

- United States Consumer Product Safety Commission. (n.d.). National Electronic Injury Surveillance System On-Line Query System. Retrieved November 28, 2021, from <https://www.cpsc.gov/cgibin/NEISSQuery>
 - The interface to query NEISS
- Inter-university Consortium for Political and Social Research. (n.d.). National Electronic Injury Surveillance System (NEISS) Series. Retrieved May 23, 2022, from <https://www.icpsr.umich.edu/web/ICPSR/series/198/publications>
 - Nice collection of NEISS publications, use for inspiration in selecting your topic
- United States Consumer Product Safety Commission. (2000). *The National Electronic Injury Surveillance System - A Tool for Researchers*. https://www.cpsc.gov/s3fs-public/pdfs/blk_media_2000d015.pdf
 - Includes some information to understand survey design and how to interpret raw data and derive sample estimate errors
- Schroeder, T., & Ault, K. (2001). *The NEISS sample (design and implementation) 1997 to Present*. https://www.cpsc.gov/s3fs-public/pdfs/blk_media_2001d011-6b6.pdf
 - Also contains information on survey design

R statistical programming resources

The following resources are available through subscription access of Datacamp.com to be provided by the Center for Injury Prevention.

Learning R

- Introduction to R (required) –
 - Course description: “In this introduction to R course, you'll master the basics of this widely used

open source language—including vectors, factors, lists, and data frames. With the coding skills you'll gain in this course, you'll be ready to undertake your own data analysis in R. There are millions of R users worldwide, cementing it as a leading programming language in statistics and data science. More and more organizations are using R, so begin your coding journey in one of DataCamp's most popular courses today!"

- <https://app.datacamp.com/learn/courses/free-introduction-to-r>
- Intermediate R (optional) –
 - Course description: “Intermediate R is the next stop on your journey in mastering the R programming language. In this R training, you will learn about conditional statements, loops, and functions to power your own R scripts. Next, make your R code more efficient and readable using the apply functions. Finally, the utilities chapter gets you up to speed with regular expressions in R, data structure manipulations, and times and dates. This course will allow you to take the next step in advancing your overall knowledge and capabilities while programming in R.”
 - <https://app.datacamp.com/learn/courses/intermediate-r>
- Introduction to the Tidyverse (required) –
 - Course description: “This is an introduction to the programming language R, focused on a powerful set of tools known as the Tidyverse. You'll learn the intertwined processes of data manipulation and visualization using the tools dplyr and ggplot2. You'll learn to manipulate data by filtering, sorting, and summarizing a real dataset of historical country data in order to answer exploratory questions. You'll then learn to turn this processed data into informative line plots, bar plots, histograms, and more with the ggplot2 package. You'll get a taste of the value of exploratory data analysis and the power of Tidyverse tools. This is a suitable introduction for those who have no previous experience in R and are interested in performing data analysis.”
 - <https://app.datacamp.com/learn/courses/introduction-to-the-tidyverse>
- Data manipulation with dplyr (optional) –
 - Course description: “Say you've found a great dataset and would like to learn more about it. How can you start to answer the questions you have about the data? You can use dplyr to answer those questions—it can also help with basic transformations of your data. You'll also learn to aggregate your data and add, remove, or change the variables. Along the way, you'll explore a dataset containing information about counties in the United States. You'll finish the course by applying these tools to the babynames dataset to explore trends of baby names in the United States.”
 - <https://app.datacamp.com/learn/courses/data-manipulation-with-dplyr>

Survey data in R

- Analyzing survey data in R (required) –
 - Course description: “You've taken a survey (or 1000) before, right? Have you ever wondered what goes into designing a survey and how survey responses are turned into actionable insights? Of course you have! In Analyzing Survey Data in R, you will work with surveys from A to Z, starting with common survey design structures, such as clustering and stratification, and will continue through to visualizing and analyzing survey results. You will model survey data from

the National Health and Nutrition Examination Survey using R's survey and tidyverse packages. Following the course, you will be able to successfully interpret survey results and finally find the answers to life's burning questions!"

- <https://app.datacamp.com/learn/courses/analyzing-survey-data-in-r>

Building data products in R

- Building web applications with Shiny in R (optional) –
 - Course description: “Shiny is an R package that makes it easy to build highly interactive web apps directly in R. Using Shiny, data scientists can create interactive web apps that allow your team to dive in and explore your data as dashboards or visualizations. If you want to bring your data to life, Shiny is the way to go! Using data about baby names, food ingredients, and UFO sightings, you'll build a variety of different Shiny apps that leverage different inputs and outputs. You'll also learn the basics of reactive expressions. By the end of this course, you'll have the Shiny skills you need to build your first app in R.”
 - <https://app.datacamp.com/learn/courses/building-web-applications-with-shiny-in-r>
- Case studies: building web applications with Shiny in R (optional) –
 - Course description: “After learning the basics of using Shiny to build web applications, this course takes you to the next level by putting your newly acquired skills into practice. You'll get experience developing fun and realistic Shiny apps for different common use cases, such as using Shiny to explore a dataset, generate a customized plot, and even create a word cloud. With all this practice and new knowledge, you will be well-equipped to develop Shiny apps for your own use.”
 - <https://app.datacamp.com/learn/courses/case-studies-building-web-applications-with-shiny-in-r>
- Example of data product made with Shiny
 - https://emhacker.shinyapps.io/shot_spotter_dc/?_ga=2.218674586.207931470.1600359366-662906469.1599711659

Scientific writing resource

Hofmann, A. H. (2020). *Scientific writing and communication: papers, proposals, and presentations* (4th ed.). Oxford University Press. (required) –

- Chapter 11 – The Introduction
- Chapter 12 – Materials and Methods
- Chapter 13 – Results
- Chapter 14 – Discussion
- Chapter 15 - Abstract

Week-by-week schedule of topics

Date	Topic(s) and readings	Assignment(s) due
6/1-6/3	<p>Injury prevention background</p> <ul style="list-style-type: none"> • Bakes, K. (2018). Injury Prevention and Control. In R. Walls (Ed.), <i>Rosen’s Emergency Medicine: Concepts and Clinical Practice</i> (9th ed., pp. e22–e28). Elsevier. • Sleet, D. A., Baldwin, G., Marr, A., Spivak, H., Patterson, S., Morrison, C., Holmes, W., Peeples, A. B., & Degutis, L. C. (2012). History of Injury and Violence as public health problems and emergence of the National Center for Injury Prevention and Control at CDC. <i>Journal of Safety Research</i>, 43(4), 233–247. https://doi.org/10.1016/J.JSR.2012.09.002 <p>NEISS introduction</p> <ul style="list-style-type: none"> • United States Consumer Product Safety Commission. (n.d.). National Electronic Injury Surveillance System On-Line Query System. Retrieved November 28, 2021, from https://www.cpsc.gov/cgibin/NEISSQuery • Inter-university Consortium for Political and Social Research. (n.d.). National Electronic Injury Surveillance System (NEISS) Series. Retrieved May 23, 2022, from https://www.icpsr.umich.edu/web/ICPSR/series/198/publications 	6/3: Topic subset selection
6/6-6/10	<p>Introduction to R</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/free-introduction-to-r <p>Introduction to the Tidyverse</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/introduction-to-the-tidyverse <p>Data manipulation with dplyr</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/data-manipulation-with-dplyr 	6/9: Finalize topic selection

<p>6/13-6/17</p>	<p>NEISS survey sample design</p> <ul style="list-style-type: none"> • United States Consumer Product Safety Commission. (2000). The National Electronic Injury Surveillance System - A Tool for Researchers. https://www.cpsc.gov/s3fs-public/pdfs/blk_media_2000d015.pdf • Schroeder, T., & Ault, K. (2001). The NEISS sample (design and implementation) 1997 to Present. https://www.cpsc.gov/s3fs-public/pdfs/blk_media_2001d011-6b6.pdf <p>Analyzing survey data in R</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/analyzing-survey-data-in-r <p>Hofmann, A. H. (2020). Scientific writing and communication: papers, proposals, and presentations (4th ed.). Oxford University Press.</p> <ul style="list-style-type: none"> • Chapter 12 – Materials and Methods 	<p>6/15: Background literature search 6/16: Finalize analysis approach 6/17: Manuscript draft - Methods</p>
<p>6/20-6/24</p>	<p>Injury prevention programming</p> <ul style="list-style-type: none"> • Kress, H. C., Noonan, R., Freire, K., Marr, A., & Olson, A. (2012). Top 20 violence and injury practice innovations since 1992. Journal of Safety Research, 43(4), 257–263. https://doi.org/10.1016/J.JSR.2012.08.002 • Venkatraman, V., Richard, C., Magee, K., & Johnson, K. (2021). Countermeasures That Work: a highway safety countermeasures guide for State Highway Offices, 10th edition. https://www.ghsa.org/resources/countermeasures 	<p>6/23: Preliminary results 6/24: Infographic brainstorming</p>

6/27-7/1	<p>Data products for injury prevention researchers and programmers</p> <p>Building web applications with Shiny in R</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/building-web-applications-with-shiny-in-r <p>Case studies: building web applications with Shiny in R</p> <ul style="list-style-type: none"> • https://app.datacamp.com/learn/courses/case-studies-building-web-applications-with-shiny-in-r <p>Hofmann, A. H. (2020). Scientific writing and communication: papers, proposals, and presentations (4th ed.). Oxford University Press.</p> <ul style="list-style-type: none"> • Chapter 13 – Results 	<p>6/29: Finalize results</p> <p>6/30: Manuscript draft – Results</p> <p>7/1: Mockup of web app product</p>
7/5-7/8	<p>Hofmann, A. H. (2020). Scientific writing and communication: papers, proposals, and presentations (4th ed.). Oxford University Press.</p> <ul style="list-style-type: none"> • Chapter 11 – The Introduction • Chapter 14 – Discussion 	<p>7/7: Manuscript draft - Introduction, Discussion</p> <p>7/8: Version 1 of web app product</p>
7/11-7/15	<p>Hofmann, A. H. (2020). Scientific writing and communication: papers, proposals, and presentations (4th ed.). Oxford University Press.</p> <ul style="list-style-type: none"> • Chapter 15 – Abstract 	<p>7/13: Manuscript draft - Abstract</p> <p>7/14: Finalize manuscript</p> <p>7/15: Finalize infographic</p>
7/18-7/22	n/a	<p>7/20: GW Emergency Medicine conference presentation (TBD)</p> <p>7/22: Version 2 of web app product</p>

Assignments

Assignment	Description
6/3: Topic subset selection	Identify a subset of consumer product injuries for analysis.
6/9: Finalize topic selection	Select the consumer product injury of interest that will be the focus of the remainder of the internship.
6/15: Background literature review	Complete a background literature search regarding the selected consumer product injury. This work will assist the drafting of the manuscript.
6/16: Finalize analysis approach	After becoming familiar with the NEISS dataset, select the analytical methods to apply in this research project.
6/17: Manuscript draft - Methods	Draft the Methods section of a manuscript that incorporates guidance from the recommended text by Angelika Hoffman.
6/23: Preliminary results	Submit preliminary results.
6/24: Infographic brainstorming	To develop injury prevention programming, consider the type of content to present in the form of an infographic. This programming output will eventually be used on the website and social media accounts of the Center for Injury Prevention.
6/29: Finalize results	Submit the final analysis deliverable that incorporates feedback as discussed.
6/30: Manuscript draft - Results	Draft the Results section of a manuscript that incorporates guidance from the recommended text by Angelika Hoffman.
7/1: Mockup of web app product (optional)	To develop injury prevention programming, there will be an opportunity to leverage your training in R to produce a web app that allows exploratory data analysis and visualization of the NEISS dataset.
7/7: Manuscript draft - Introduction, Discussion	Draft the Introduction and Discussion sections of a manuscript that incorporates guidance from the recommended text by Angelika Hoffman.
7/8: Version 1 of web app product (optional)	Submit a version 1 of the web app product.
7/14: Finalize manuscript	Submit the final manuscript deliverable that incorporates feedback as discussed.
7/15: Finalize infographic	Submit the final infographic deliverable that incorporates feedback as discussed.
7/20: Presentation at GWEM residency grand rounds	(date/time to be finalized)
7/22: Version 2 of web app product (optional)	Submit a version 2 of the web app product that incorporates feedback as discussed.

University policies

Academic Integrity Code

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the [Code of Academic Integrity](#). If you have any questions about whether or not particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the SRR website (<https://studentconduct.gwu.edu/academic-integrity>), email rights@gwu.edu, or call 202-994-6757.

University policy on observance of religious holidays

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, see “Religious Holidays” at provost.gwu.edu/policies-procedures-and-guidelines.

Use of Electronic Course Materials and Class Recordings

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic support

Writing Center

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online at gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Support for students outside the classroom

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services at disabilitysupport.gwu.edu to establish eligibility and to coordinate reasonable accommodations..

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services.

Safety and Security

- In an emergency: call GWPD 202-994-6111 or 911
- For situation-specific actions: review the Emergency Response Handbook at: safety.gwu.edu/emergency-response-handbook
- In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret
- Stay informed: safety.gwu.edu/stay-informed